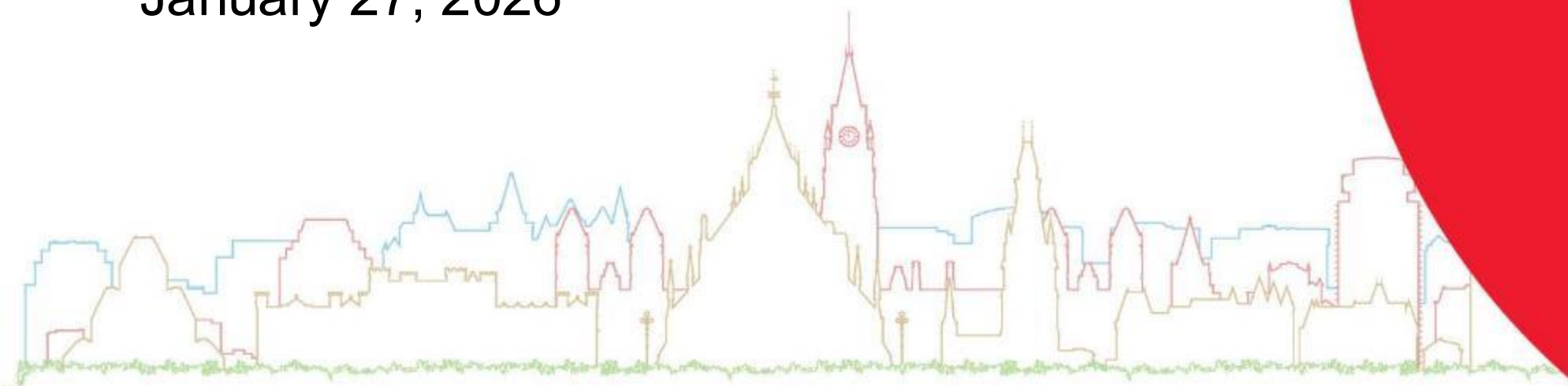
O-Train Line 1 Update

Technical Briefing: Line 1 Service Delivery Action Plan

January 27, 2026

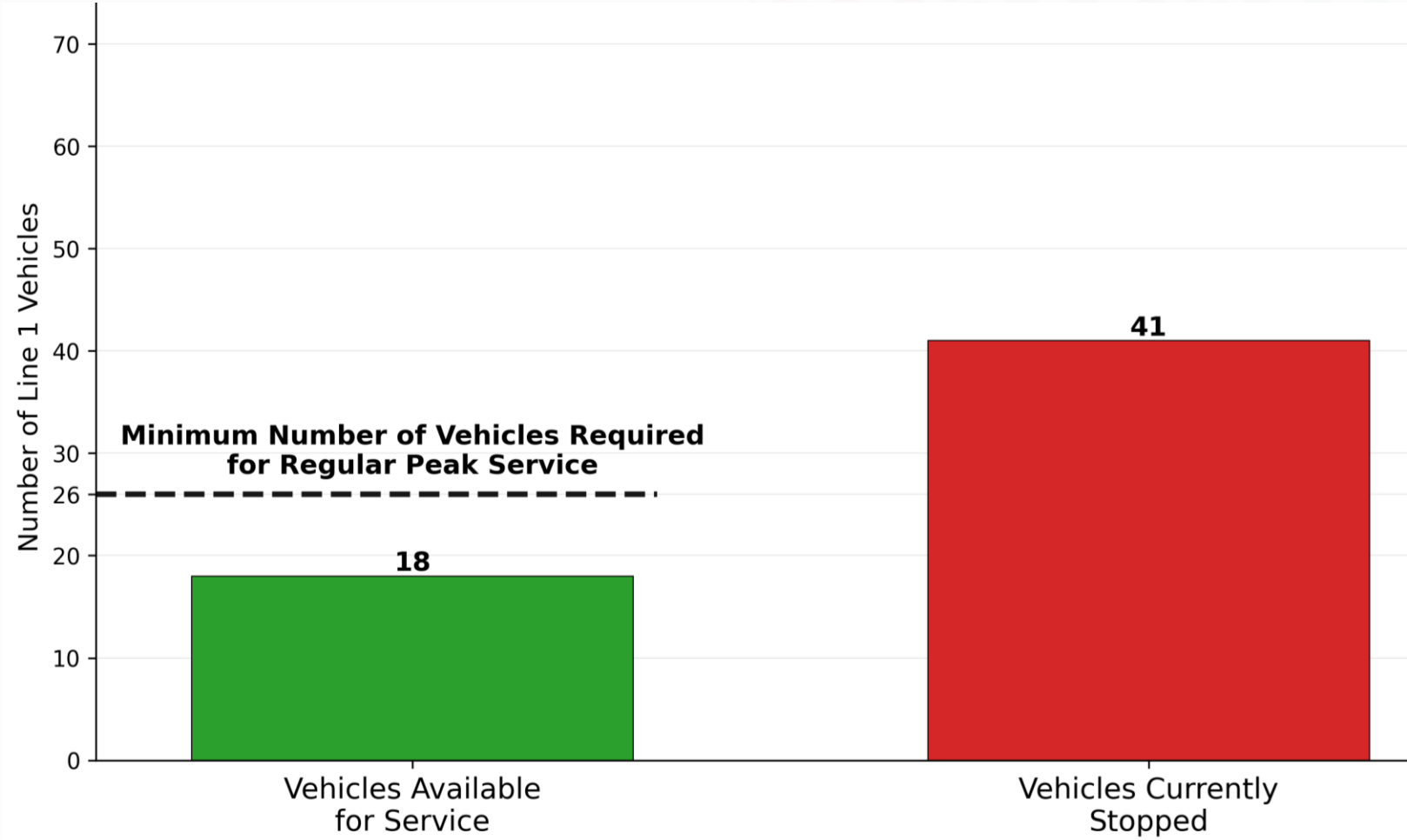


Overview

- O-Train Line 1 remains safe for customers and staff with the corrective actions put in place
- We understand that this new axle bearing issue is disruptive for customers; safety is always our primary focus
- Today: we are talking about our action plan to restore Line 1 capacity for customers
- Action plan has three clear work streams that assure safety for customers while keeping RTG accountable
- Our immediate goal is to safely restore capacity for customers while ensuring that the spalling on the Cartridge Bearing Assemblies (CBAs) is appropriately addressed
- The City's expectation is that the spalling issue will be fixed by RTG. A root cause analysis is necessary to determine an appropriate fix.
- It is too early to determine impacts, if any, to the O-Train East Extension

Current Fleet Status

- 26 vehicles are required for normal, peak service
- Vehicles in service will fluctuate
- Regular preventative maintenance is still required
- Short-term unplanned issues may also require corrective work
- Strategic management of fleet mileage is necessary

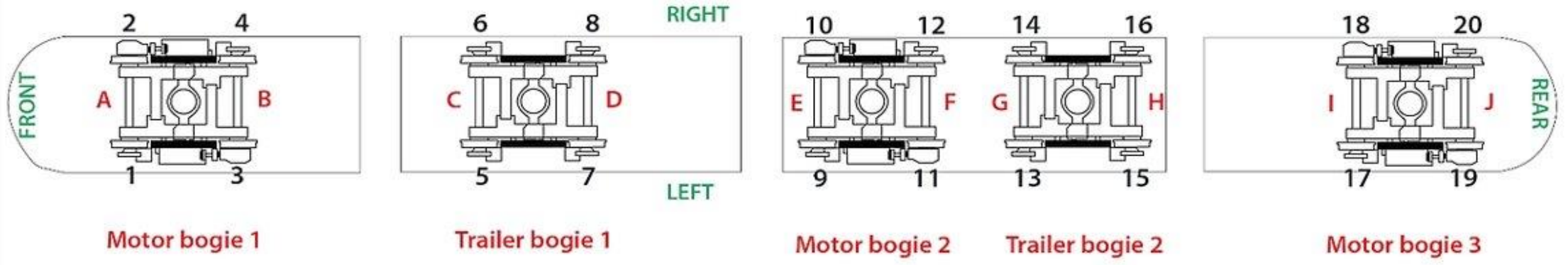


Current Situation

- RTG advised that spalling was detected on some CBAs during an inspection
- RTG provided the City with documentation from its subcontractor, Alstom, stating the fleet was safe to operate
- 24 CBAs have been inspected and found spalling on 8 CBAs
- RTG has not provided the appropriate information showing that containment measures can detect spalling
- The City is working with independent experts, like TRA, to review the information that has been provided to date
- Based on currently available information, the City has required that:
  1. Vehicles with CBAs with 100,000 kilometres of mileage cannot continue in service until replaced or supporting information and processes are in place to detect spalling
  2. Additional technical and safety assurance information must be provided to support containment and mitigation plans

Background: Light Rail Vehicle

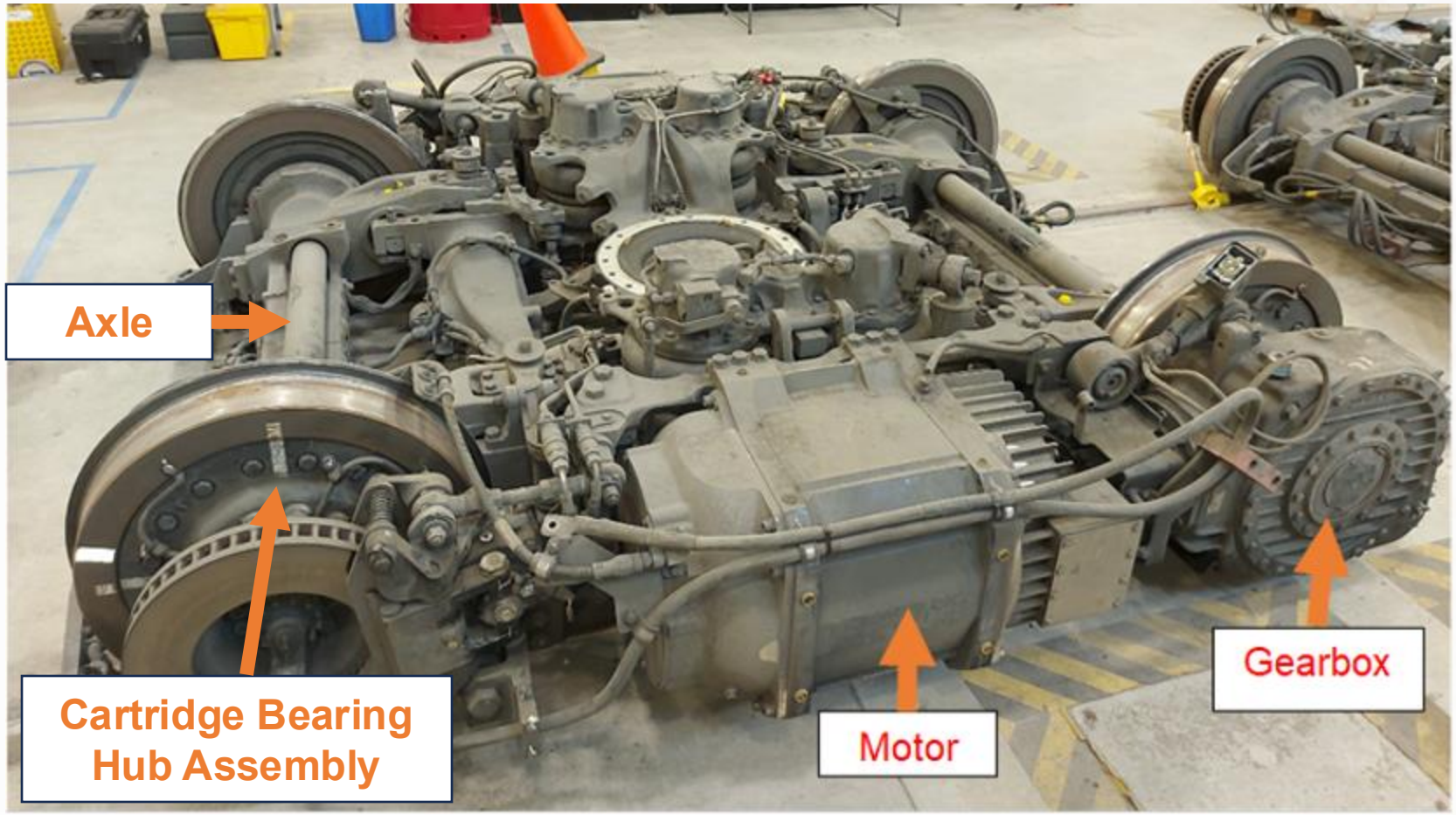
- Each vehicle has 5 bogies
  - Three motor bogies and two trailer bogies
- Each bogie has 2 axles
  - Ten axles per vehicle
- Each axle has 2 CBAs



Background: Bogie



Background: Bogie



Background: Bearing Hub Assembly





Background: Example Tapered Roller Bearings



Inner race Cage Roller Outer race



Source: SKF

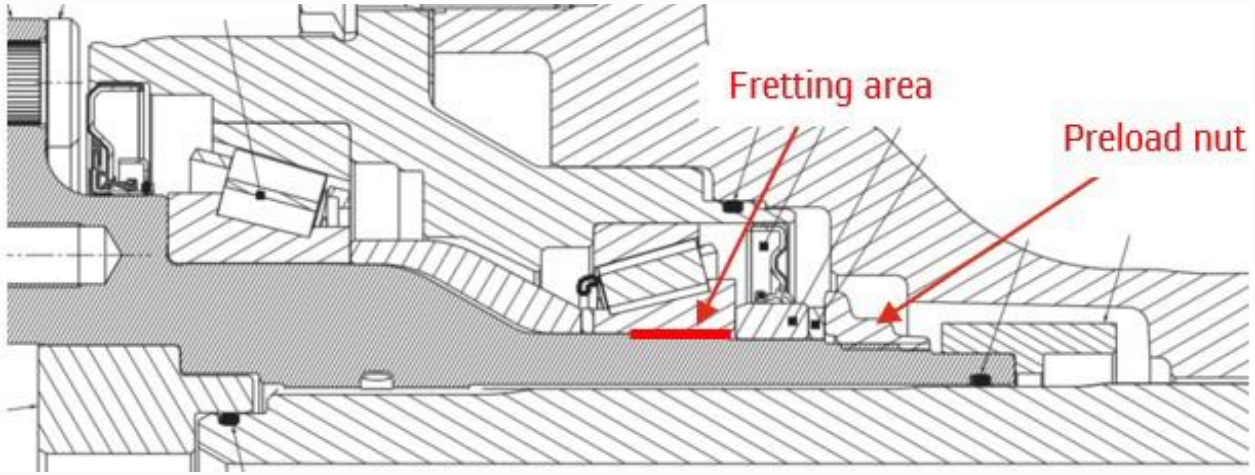
What is Spalling?

- Spalling is when the surface of a hard material starts to flake or chip, over time it weakens the material and can crack
- Spalling has been found inside the axle bearing, and if not addressed, it could lead to an axle bearing failure

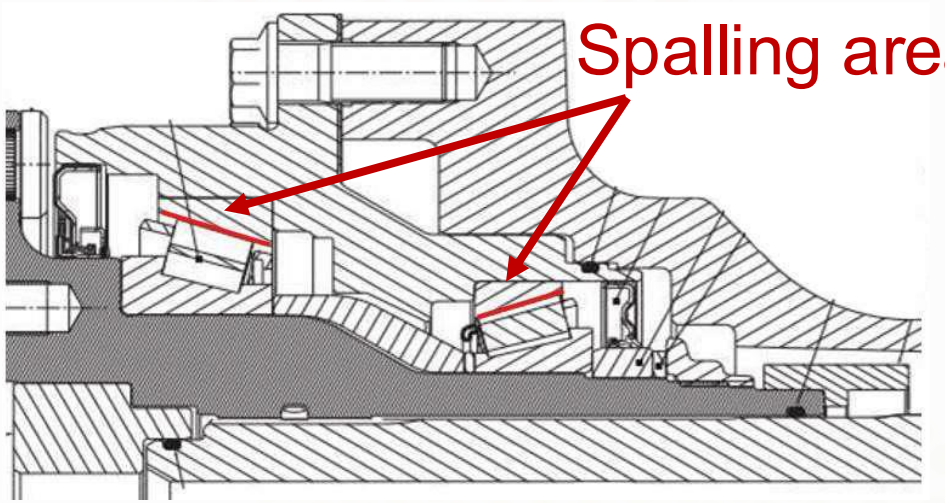


CBA Issues: Fretting and Spalling

Initial CBA issue: Fretting

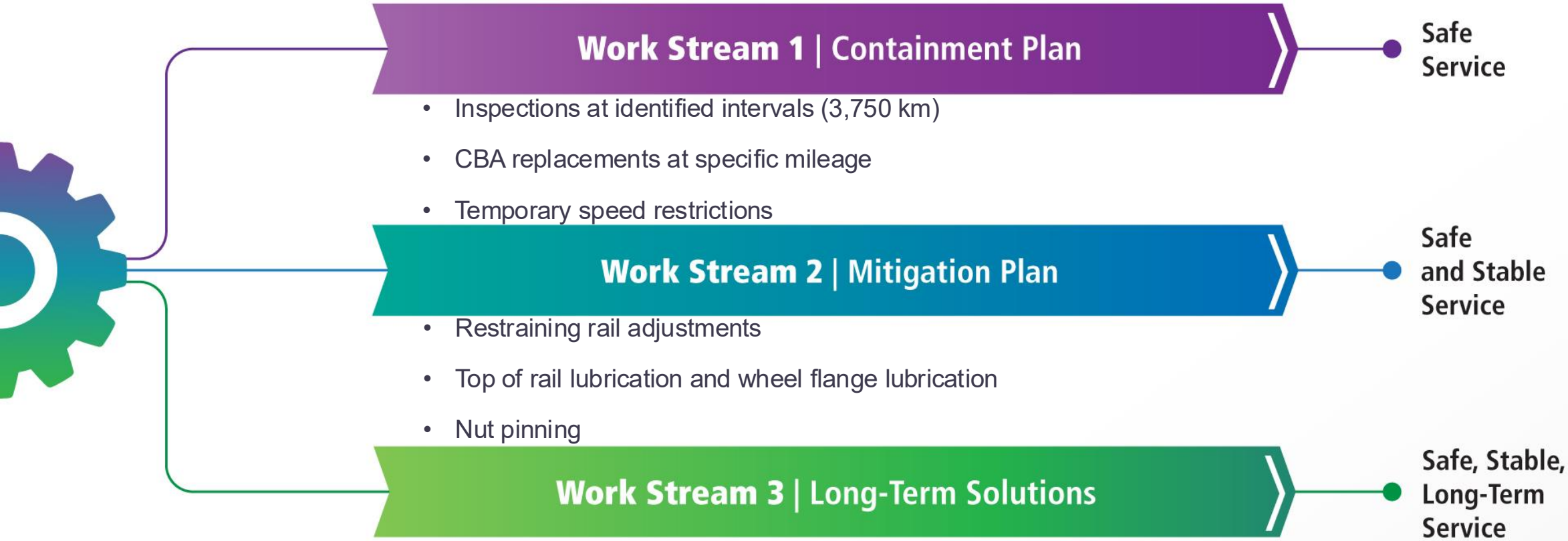


New CBA issue: Spalling



Spalling is a different type of damage but involves the same component of the vehicle as the initial CBA issue

Work Continues on Initial CBA Issue



New CBA Issue: Spalling

- Currently, spalling has only been detected in CBAs with over 100,000 km
- Once spalling has occurred, the bearing will continue to deteriorate unless detected and replaced
  - The rate of deterioration in CBAs on our fleet has not been evaluated
- As spalling progresses, it increases vibrations, noise, and leads to increased operating temperature
- If not contained:
  - Spalling will cause damage to components of the bearing
  - If undetected, it can lead to bearing failure

Action Plan Work Streams

Work Stream 1: Immediate actions	Work Stream 2: Monitoring and analysis, validation	Work Stream 3: Long-term actions
• Containment measures proposed by RTG • Technical review by OC Transpo and TRA of RTG's proposed containment measures and other information • The City's Chief Safety Officer's Safety Orders • Vehicles with CBAs with more than 100,000 kms stopped	• RTG to provide complete risk assessment • RTG to provide validation and verification that proposed containment measures can detect spalling • RTG to conduct technical review and analysis, including laboratory testing of CBAs and bearing expert review • City to be provided with results to ensure the information is complete and meets applicable standards • Installation of detection measurement and condition monitoring system	• Root cause analysis leading to long-term solution that provides safe, stable, service • Implementation of safe, long-term solution

Containment Measures

- OC Transpo and TRA will continue to conduct technical reviews of information provided by RTG
- TRA will continue to be engaged and provide independent expertise on returning to full Line 1 capacity
- The City's Chief Safety Officer's safety order will remain in place until the City is satisfied

Risk Identification and Validation

- A complete risk assessment must be provided
- As part of the risk assessment, verification and validation of proposed containment measures needs to be provided by RTG and its subcontractors to demonstrate that proposed containment measures prevent spalling
- The risk assessment must account for the frequency and the possible range of severity of the spalling issue, in accordance with RTG's and RTM's Safety Management Systems, as well as OC Transpo's Safety Management System, good industry practice, and applicable law

Technical Review and Analysis

- This issue is complex, requiring specialized subject matter expertise
- RTG has advised that they plan to hire a consultant to provide additional expertise on bearings and monitoring techniques
- In addition, experts from Europe on safety and risk management have been engaged
- 7 CBAs are undergoing laboratory testing and analysis
- Additional CBAs from different vehicles are required to undergo a tear down and further inspection and analysis

Condition Monitoring

- RTG has been asked to investigate the installation of detection measurement and a condition monitoring system
- This analysis is in alignment with the Transportation Safety Board Rail Safety Advisory Letter (2023) regarding containment measures and condition monitoring

Long-Term Actions

- A complete root cause analysis leading to long-term solution that provides safe, stable service on Line 1
- Implementation of the safe long-term solution

Line 1 Operations

- Large volumes of customers on trains, but no unsafe overcrowding has been reported
- In an effort to improve Line 1 service for our customers:
  - We increased peak service frequency to three to four minutes
  - Keeps customers moving and reduces crowding at busiest times
- Thankful for the safe behaviours we have seen at stations, including:
  - Standing behind the yellow line at all times
  - Not holding doors, allowing trains to keep moving

What Customers Can Expect

- Operations will continue with increased frequency on Line 1
- A change in operations will be made when RTG is able to consistently provide more vehicles for revenue service
- Transit Operations Control Centre will continue to monitor in real time and adjust where possible
- We will continue to keep customers informed through alerts on octranspo.com, text messages and social media

Summary

- The trains currently operating on Line 1 continue to be safe for customers and staff
- O-Train Lines 2 and 4 are not affected by this issue
- There is a clear action plan with parallel work streams underway to ensure capacity on Line 1 is safely restored for customers
- Our action plan has three goals:
  - Ongoing safety assurance process
  - Increasing service for customers
  - Stable, safe and reliable service
- Our action plan safely restores service while holding RTG accountable
- We are committed to continuing to provide updates as they become available

Questions?

